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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,628	11/17/2003	Garro J. Derderian	MI22-2427	4321
21567	7590	07/25/2007		
WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201			EXAMINER ZERVIGON, RUDY	
			ART UNIT 1763	PAPER NUMBER
			MAIL DATE 07/25/2007	DELIVERY MODE PAPER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/715,628
Filing Date: November 17, 2003
Appellant(s): DERDERIAN ET AL.

**MAILED
JUL 25 2007
GROUP 1700**

Jennifer J. Taylor
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 9, 2007 appealing from the Office action mailed October 31, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6086679	LEE	7-2000
5284519	GADGIL	2-1994

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102/103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 5-11, and 17 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Gadgil; Prasad N. (US 5284519 A) in view of (if necessary) Lee; Chung J. et al. (US 6,086,679 A). Gadgil teaches a deposition system (Figure 1,2,18; column 3, lines 30-60) comprising: a deposition chamber (2; Figure 18; column 3, lines 30-60) having an inlet port (bottom of 38; Figure 2; column 4, lines 1-15); a first reservoir (44; Figure 2; column 5; lines 1-15) external (10; Figure 1 appears to be 38; Figure 2) to the deposition chamber (2; Figure 18; column 3, lines 30-60) configured for containment of a first metastable specie, the first reservoir (44; Figure 2; column 5; lines 1-15) comprising an outlet port (top of 38; Figure 2; column 5; lines 1-15) in selective fluid communication with the inlet port (bottom of 38; Figure 2; column 4, lines 1-15) of the deposition chamber (2; Figure 18; column 3, lines 30-60) – claim 1. Applicant's claim 1 requirement of "a metastable-specie generating catalyst within the first reservoir ", as claimed by claim 1 is a claim requirement of intended use.

Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably

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distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

Gadgil further teaches the deposition system (Figure 1, 2, 18; column 3, lines 30-60) of claim 1 further comprising: a substrate platform (16; Figure 1); and a dispersion head (12; Figure 1) between the inlet port (bottom of 38; Figure 2; column 4, lines 1-15) and the substrate platform (16; Figure 1), as claimed by claim 6

Gadgil further teaches:

- i. Gadgil's deposition system (Figure 1, 2, 18; column 3, lines 30-60) of claim 1 further comprising: a second reservoir (40; Figure 2; column 3, lines 30-60) configured for containment of a second metastable specie, the second reservoir (40; Figure 2; column 3, lines 30-60) comprising a second reservoir (40; Figure 2; column 3, lines 30-60) outlet port (34; Figure 2) in selective fluid communication with Gadgil's deposition chamber (2; Figure 18; column 3, lines 30-60), as claimed by claim 7
- ii. Gadgil's deposition system (Figure 1, 2, 18; column 3, lines 30-60) of claim 7 wherein Gadgil's inlet port (bottom of 38; Figure 2; column 4, lines 1-15) of Gadgil's deposition chamber (2; Figure 18; column 3, lines 30-60) is a first inlet port (bottom of 38; Figure 2; column 4, lines 1-15), Gadgil's deposition chamber (2; Figure 18; column 3, lines 30-60) further comprising a second inlet port (32), wherein the outlet port (top of 38; Figure 2; column 5; lines 1-15) of the second reservoir (40; Figure 2; column 3, lines 30-60) is in selective fluid communication with Gadgil's deposition chamber (2; Figure 18; column 3, lines 30-60) through the second inlet port, as claimed by claim 8

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- iii. Gadgil's deposition system (Figure 1,2,18; column 3, lines 30-60) of claim 7 wherein Gadgil's metastable-specie generating catalyst is a first metastable-specie generating catalyst, and further comprising a second metastable-specie generating catalyst within the second reservoir (40; Figure 2; column 3, lines 30-60), as claimed by claim 9
- iv. An atomic layer deposition apparatus comprising: a deposition chamber (2; Figure 18; column 3, lines 30-60) having a first inlet (bottom of 38; Figure 2; column 4, lines 1-15), a second inlet (32), a dispersion head (32; Figure 2), and a substrate platform (16; Figure 2); Gadgil's dispersion head (32; Figure 2) being positioned between Gadgil's first inlet (bottom of 38; Figure 2; column 4, lines 1-15) and Gadgil's substrate platform (16; Figure 2) and between the second inlet (32) and Gadgil's substrate platform (16; Figure 2); a first activated specie containment reservoir (40; Figure 2) disposed external (10; Figure 1 appears to be 38; Figure 2) to the deposition chamber (2; Figure 18; column 3, lines 30-60), in fluid communication with Gadgil's deposition chamber (2; Figure 18; column 3, lines 30-60) through Gadgil's first inlet (bottom of 38; Figure 2; column 4, lines 1-15); a second activated specie containment reservoir (44; Figure 2) disposed external (10; Figure 1 appears to be 38; Figure 2) to the deposition chamber (2; Figure 18; column 3, lines 30-60), in fluid communication with Gadgil's deposition chamber (2; Figure 18; column 3, lines 30-60) through the second inlet (32); and one or more carrier gas sources configured to deliver carrier gas through at least one of Gadgil's first inlet (bottom of 38; Figure 2; column 4, lines 1-15) and the second inlet (32), as claimed by claim 17. Applicant's claim requirement of "An atomic layer deposition apparatus" is a claim requirement of intended use. Additionally, when the structure recited in the

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reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01). Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

Gadgil does not teach:

- i. The deposition system (Figure 1,2,18; column 3, lines 30-60) of claim 1 wherein the catalyst comprises Pt, as claimed by claim 2
- ii. The deposition system (Figure 1,2,18; column 3, lines 30-60) of claim 1 wherein the catalyst comprises Zn, as claimed by claim 3
- iii. The deposition system (Figure 1,2,18; column 3, lines 30-60) of claim 1 further comprising a carrier gas source in selective fluid communication with the deposition chamber (2; Figure 18; column 3, lines 30-60) through the inlet port (bottom of 38; Figure 2; column 4, lines 1-15), as claimed by claim 5. Applicant's claim requirement of a gas identity being a "carrier gas" is a claim requirement of intended use. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205

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USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

- iv. Gadgil's deposition system (Figure 1, 2, 18; column 3, lines 30-60) of claim 7 further comprising a carrier gas source in selective fluid communication with Gadgil's deposition chamber (2; Figure 18; column 3, lines 30-60) through the second inlet port, as claimed by claim 10 – However, applicant's claim requirements of gas identity as "carrier gas" does not further limit applicant's pending apparatus claims. Intended use must result in a structural difference between the claimed invention and the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).
- v. Gadgil's deposition system (Figure 1, 2, 18; column 3, lines 30-60) of claim 7 further comprising: the remote metastable specie source, wherein the second reservoir (40; Figure 2; column 3, lines 30-60) comprises an inlet port (34; Figure 2) in fluid communication with a remote metastable specie source, as claimed by claim 11

Lee teaches:

- i. The deposition system (Figure 5; column 14; lines 24-50) of claim 1 wherein the catalyst (528; Figure 5; column 14; lines 24-50) comprises Pt (column 19; lines 33-41), as claimed by claim 2

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- ii. The deposition system (Figure 5; column 14; lines 24-50) of claim 1 wherein the catalyst (528; Figure 5; column 14; lines 24-50) comprises Zn (column 19; lines 33-41), as claimed by claim 3
- iii. The deposition system (Figure 5; column 14; lines 24-50) of claim 1 further comprising a carrier gas source in selective fluid communication with the deposition chamber (520; Figure 5; column 14; lines 24-50) through the inlet port (516; Figure 5; column 14; lines 24-50), as claimed by claim 5. Applicant's claim requirement of a gas identity being a "carrier gas" is a claim requirement of intended use. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

In the event that Gadgil's apparatus is not deemed to anticipate the pending apparatus claims of the present application, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add Lee's precursor materials to Gadgil's reservoirs.

Motivation to add Lee's precursor materials to Gadgil's reservoirs is for creating polymer thin films as taught by Lee (column 1; lines 25-33).

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Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 4, and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gadgil; Prasad N. (US 5284519 A) in view of (if necessary) Lee; Chung J. et al. (US 6,086,679 A). Gadgil is discussed above.

Gadgil does not teach:

- i. The deposition system (Figure 1,2,18; column 3, lines 30-60) of claim 1 further comprising a heat source configured to heat the catalyst, as claimed by claim 4
- ii. Gadgil's deposition system (Figure 1,2,18; column 3, lines 30-60) of claim 11 wherein Gadgil's remote metastable specie source comprises a metastable specie generator comprising one or more of a plasma source, a catalyst, a heater, an electron gun, a UV light source and a microwave source, as claimed by claim 12
- iii. A deposition apparatus comprising: a deposition chamber (2; Figure 18; column 3, lines 30-60) having a first volume (2; Figure 1); at least one containment reservoir (44, 40; Figure 2) disposed external (10; Figure 1 appears to be 38; Figure 2) to the deposition chamber (2; Figure 18; column 3, lines 30-60), fluidly connected to Gadgil's deposition chamber (2; Figure 18; column 3, lines 30-60) and having a second volume (34; Figure 2), Gadgil's second volume (34; Figure 2) being at least about 1% of Gadgil's first volume (2; Figure 1); a remote metastable specie source in fluid communication with at least one of the containment reservoirs (44, 40; Figure 2), as claimed by claim 13

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- iv. The apparatus of claim 13 wherein the second volume (34; Figure 2) is greater than or equal to about 10% of Gadgil's first volume (2; Figure 1), as claimed by claim 14
- v. The apparatus of claim 13 wherein Gadgil's second volume (34; Figure 2) is greater than or equal to about 50% of Gadgil's first volume (2; Figure 1), as claimed by claim 15
- vi. The apparatus of claim 13 wherein Gadgil's second volume (34; Figure 2) is equal to or greater than Gadgil's first volume (2; Figure 1), as claimed by claim 16

Lee teaches the deposition system (Figure 5; column 14; lines 24-50) of claim 1 further comprising a heat source (532; Figure 5) configured to heat the catalyst (528; Figure 5; column 14; lines 24-50), as claimed by claim 4

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Lee's heat source and to reproduce Gadgil's reservoirs and inlet ports under optimal relative dimensions.

Motivation to add Lee's heat source and to reproduce Gadgil's reservoirs and inlet ports under optimal relative dimensions is for creating polymer thin films as taught by Lee (column 1; lines 25-33) and increasing processing speed and throughput, respectively. Further it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art. (Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); In re Rose, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

(10) Response to Argument

Applicant states, in assorted portions of the 4/9/7 brief, that Gadgil's Figures 1 and 2 are distinct embodiments. In response, the Examiner agrees to the extent that if Gadgil's Figures 1 and 2 are

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completely distinct embodiments with completely distinct named elements, this fact does not impact the Examiner's rejections which overwhelmingly cite Figure 2 elements as equivalents. Figure 2 appears to add additional elements already present in Figure 1, and at the same time, deemphasizes certain elements. See the Examiner's final rejections. Figure 2 is appears to be a *detailed* view of some common elements shown in Figure 1. In particular, 42, Figure 2 is a detailed view of 6, Figure 1 which are both "nozzles". Likewise, 40, Figure 2 is a detailed view of 4, Figure 1 which are both "mixing chambers". Numerous other corresponding part names in both Figure 1 and 2 can be made. Further, it is noted that seam 28, Figure 1 is also present, but not labeled, in Figure 2. Additionally, Gadgil apparently deemphasizes in Figure 2 elements present above 28 in Figure 1. Indeed, the elements *taken alone* in Figure 2 would be useless. As a result, elements present above 28 in Figure 1 appear to be expressly implied, but not shown, in Figure 2.

Applicant states:

"

As indicated above, each of independent claims 1 and 17 recites a deposition system or apparatus having a containment reservoir. In claim 1, such reservoir is in selective fluid communication with the deposition chamber. The Office again combines features of distinct embodiments relying upon Gadgil, Fig. 1 in combination with Gadgil, Fig. 2.

"

In response, the Examiner simply refers to the Examiner's final rejection recitation of Gadgil's "first activated specie containment reservoir (40; Figure 2)", and "second activated specie

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containment reservoir (44; Figure 2)". Note, no additional Figures are recited. Figures 1 and 2 are also detailed, with less specificity, in Figure 18.

Applicant also states (page 10):

"

The Office further identifies the bottom of feature 38 of Fig. 2 as both an inlet port and an outlet port while inlet nozzles 42 and 46 have been clearly identified by the specification for introducing gas into corresponding mixing chamber 40 and 44. Accordingly, it is unclear as to how the Office interprets Gadgil to provide selective fluid communication and/or containment within a chamber via feature 38 which the Office refers to as an inlet port and an outlet port, but which Gadgil identifies as a capillary group (col. 5, II. 1-15). Nor does the capillary group provide containment or selective communication. Since each of claims 1 and 17 recites containment reservoirs and claim 1 specifically recites selective fluid communication from the containment reservoir, such claims are clearly not anticipated or rendered obvious by Gadgil.

"

In response, when the Examiner started considering equivalents in Gadgil, and the prior art in general, the Examiner referenced Applicant's specification for guidance. In particular, Applicant's "inlet port(s)" are illustrated as elements 16 and 34 in Figure 1 ([0018]). Likewise, Applicant's "outlet port(s)" are illustrated as elements 18 and 32 in Figure 1 ([0019]). So, effectively Applicant has identified the extremities of a conduit as inlet and outlet. Per Applicant's guidance, the Examiner has also identified in Gadgil the extremities of a conduit (38; Figure 2) as inlet port (bottom of 38; Figure 2; column 4, lines 1-15) and outlet port (top of 38; Figure 2; column 5; lines 1-15). Further, within the additional context of the *claimed* apparatus,

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Gadgil was cited as teaching a deposition chamber (2; Figure 18; column 3, lines 30-60) having an inlet port (bottom of 38; Figure 2; column 4, lines 1-15). Further, within the additional context of the *claimed* apparatus, Gadgil was cited as teaching a first reservoir (compare Gadgil's 44 Figure 2 and Applicant's 14, Figure 1) comprising an outlet port (top of 38; Figure 2; column 5; lines 1-15) in selective fluid communication with the inlet port (bottom of 38; Figure 2; column 4, lines 1-15). The Examiner notes that Gadgil's geometric structure is slightly different from Applicant's Figure 1, however, the *claimed* apparatus, including functional requirements, are expressly taught by Gadgil as conveyed by the Examiner. The Examiner urges the reader to follow gas flows through Gadgil's equivalents and compare these gas flows in Applicant's Figure 1.

With respect to the Applicant's arguments concerning the Examiner's citation that Applicant's claimed "a metastable-specie generating catalyst within the first reservoir", as claimed by claim 1 is a claim requirement of intended use, the Examiner believes, to the best of his knowledge, that his case law citations broadly illustrate differences between *claimed structure* in apparatus claims and *non-structural* components of the claimed apparatus. Likewise, the Examiner's citation that Applicant's claimed "x" source, where x is either "carrier gas" or "metastable-specie" is an intended use recitation in the pending apparatus claims. Gadgil clearly shows "sources" of gas (He, O₂, and 97-99; Figure 18) which do not contain "metastable-specie". Helium is commonly identified and used as a carrier gas in the prior art.

Applicant further states (Page 10):

"

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Accordingly, it is unclear as to how the Office interprets Gadgil to provide selective fluid communication and/or containment within a chamber via feature 38 which the Office refers to as an inlet port and an outlet port, but which Gadgil identifies as a capillary group (col. 5, II. 1-15). Nor does the capillary group provide containment or selective communication. Since each of claims 1 and 17 recites containment reservoirs and claim 1 specifically recites selective fluid communication from the containment reservoir, such claims are clearly not anticipated or rendered obvious by Gadgil

“

With respect to Gadgil and the claimed invention, the Examiner stated that Gadgil teaches “the first reservoir (44; Figure 2; column 5; lines 1-15) comprising an outlet port (top of 38; Figure 2; column 5; lines 1-15) in selective fluid communication with the inlet port (bottom of 38; Figure 2; column 4, lines 1-15) of the deposition chamber (2; Figure 18; column 3, lines 30-60)”. As conveyed above, the Examiner started considering equivalents in Gadgil, and the prior art in general, by using Applicant’s specification for guidance. In particular, Applicant’s claimed “first reservoir comprising an outlet port in selective fluid communication with the inlet port of the deposition chamber” is conveyed in the specification and Figures by “inlet port(s)” as elements 16 and 34 in Figure 1 ([0018]). Likewise, Applicant’s “outlet port(s)” are illustrated as elements 18 and 32 in Figure 1 ([0019]). Applicant has thus identified the extremities of a conduit as inlet and outlet which are designed to have “selective fluid communication”. Per Applicant’s guidance, the Examiner has also identified in Gadgil the extremities of a conduit (38; Figure 2) as inlet port (bottom of 38; Figure 2; column 4, lines 1-15) and outlet port (top of 38; Figure 2; column 5; lines 1-15) and also having “selective fluid communication”.

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Further, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., means for selective fluid communication) are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The Examiner has gone on record that Gadgil's "capillaries 38" provides the broadest reasonable interpretation for "selective fluid communication". It is well established that claim terms are issued their "plain meaning" according to MPEP 2111.01: Claim terms are presumed to have the ordinary and customary meanings attributed to them by those of ordinary skill in the art. *Sunrace Roots Enter. Co. v. SRAM Corp.*, 336 F.3d 1298, 1302, 67 USPQ2d 1438, 1441 (Fed. Cir. 2003); *Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1298 67 USPQ2d 1132, 1136 (Fed. Cir. 2003).

With respect to the Examiner's drawing objection concerning Applicant's specification not citing the claimed "dispersion head", the Examiner hereby withdraws said objection in light of Applicant's explanation on page 13 and the no "*in haec verba*" requirement.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Rudy Zervigon, Primary Examiner, Art Unit 1763

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7/17/7

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